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Tomomi Katoh

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EXAMINER

LEBRON, JANNELLE M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,791	Applicant(s) KATOH, TOMOMI	
	Examiner JANNELLE M. LEBRON	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/15/2008 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Basis for the added limitation "the non-ejecting pulse generated by said driving signal generating unit using the two or more different portions of the driving waveform has a pulse width greater than that of the ejecting pulse and has a smaller electric potential difference than that of the ejecting pulse" is not found on the specification. Please note that paragraph 0081 indicates that if "*the pulse*

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width of the dummy signal becomes large, and the driving period becomes long. This results in a decreased printing rate."

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-3 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "the non-ejecting pulse having a pulse width greater than that of the ejecting pulse" and "the non-ejecting pulse generated by said driving signal generating unit using the two or more different portions of the driving waveform has a pulse width greater than that of the ejecting pulse and has a smaller electric potential difference than that of the ejecting pulse" is unclear. If the non-ejecting pulse is generated by using two or more different portions of a driving waveform, then it is unclear if only one of the two or more different portion, all portions of the two or more different portions or a sum of the two or more different portions has a pulse width greater than that of the ejecting pulse if both portion, Additionally, it is unclear how the non-ejecting pulse can have a pulse width greater than that of the ejecting pulse if it is a portion of the ejecting pulse [see limitation: wherein at least one of the two or more different portions of the driving waveform (that form the non-ejecting pulse) is a portion of an (the) ejecting pulse.]

Claim Objections

6. Claims 1-3 are objected to because of the following informalities: in lines 14, 17 and 17, respectively, "an ejecting pulse" should be replaced by -- the ejecting pulse --. Appropriate correction is required.

7. Claim 2 is objected to because of the following informalities: in line 16, "the two or more" should be replaced by -- at least two --. Appropriate correction is required.

8. Claim 3 is objected to because of the following informalities: the claim recites the limitation "two or more different portions of the driving waveform" in line 16. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-17, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Kusunoki et al. (WO 03/026897).

Kusunoki et al. discloses the following claimed limitations:

- **Claim 1:** an image reproducing and forming apparatus comprising:
 - an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;

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- a driving signal generating unit (circuit 77; page 24, line 16 through page 25, line 3) configured to generate a driving signal having a waveform (as seen in figs. 13 and 14) that includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse (as seen in fig. 15), and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse (as seen in fig. 16; page 37, lines 8-16) making use of two or more different portions of the driving waveform (note that the non-ejecting pulse uses portions s1 and s2 in fig. 15; see 112 rejections above; additionally, depending on the embodiment, the apparatus uses two different portions of the driving waveform; the limitation does not specify that it has to be on the same printing cycle), the non-ejecting pulse having a pulse width greater than that of the ejecting pulse (this limitation is not found in the disclosure and thus is not taken into consideration for purposes of examination; in addition, please note that the importance of the non-ejecting pulse being kept small is pointed out, at least, in paragraphs 0015, 0081, 0088 and 0099; also see 112 rejections above) while producing energy for not ejecting the droplet; and
- a driving unit (head driving unit 71) configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit (page 24, line 16 through page 25, line 3),

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- wherein at least one of the two or more different portions of the driving waveform is a portion of an ejecting pulse (as seen in fig. 15), and the non-ejecting pulse generated by said driving signal generating unit using the two or more different portions of the driving waveform has a pulse width greater than that of the ejecting pulse and has a smaller electric potential difference than that of the ejecting pulse (this limitation is not found in the disclosure and thus is not taken into consideration for purposes of examination; in addition, please note that the importance of the non-ejecting pulse being kept small is pointed out, at least, in paragraphs 0015, 0081, 0088 and 0099; also see, 112 rejections above).

- **Claim 2:**

- an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;
- a driving signal generating unit (circuit 77; page 24, line 16 through page 25, line 3) configured to generate a driving signal having a waveform (as seen in figs. 13 and 14) that includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse (as seen in fig. 15), and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse (as seen in fig. 16; page 37, lines 8-16) making use of at least two different portions of the driving waveform (see 112 rejections above; note that the non-ejecting pulse uses

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portions s1 and s2 in fig. 15; also, depending on the embodiment, the non-ejecting pulse uses a different portion of the driving waveform in figs. 15 and 17;), the non-ejecting pulse producing energy for not ejecting the droplet; and

- a driving unit (head driving unit 71) configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit (page 24, line 16 through page 25, line 3),
- wherein a driving waveform includes first and second dummy pulses and a driving signal generating unit produces a non-ejecting pulse making use of a portion of the first dummy pulse and a portion of the second dummy pulse (the non-ejecting pulse includes two portions; as seen in fig. 10, page 27, line 19 through page 28, line 13),
- wherein at least one of the two or more different portions of the driving waveform is a portion of an ejecting pulse (as seen in fig. 15), and the non-ejecting pulse generated by said driving signal generating unit using the two or more different portions of the driving waveform has a pulse width greater than that of the ejecting pulse and has a smaller electric potential difference than that of the ejecting pulse (this limitation is not found in the disclosure and thus is not taken into consideration for purposes of examination; in addition, please note that the importance of the non-ejecting pulse being kept small is pointed out, at least, in paragraphs 0015, 0081, 0088 and 0099; also see, 112 rejections above).

- **Claim 3:**

- an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;
- a driving signal generating unit (circuit 77; page 24, line 16 through page 25, line 3) configured to generate a driving signal having a waveform (as seen in figs. 13 and 14) that includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse (as seen in fig. 15), and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse (as seen in fig. 16; page 37, lines 8-16) making use of different portions of the driving waveform (note that the non-ejecting pulse uses portions s1 and s2 in fig. 15; see 112 rejections above; also, please note that the non-ejecting pulse uses a different portion of the driving waveform in figs. 15 and 17), the non-ejecting pulse producing energy for not ejecting the droplet; and
- a driving unit (head driving unit 71) configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit (page 24, line 16 through page 25, line 3),
- wherein the driving waveform includes a dummy pulse [non-ejection pulse] and the driving signal generating unit produces the non-ejecting pulse, making use of a portion of the dummy pulse and a portion of the ejecting pulse; page 27, line 19 through page 28, line 13),

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- wherein at least one of the two or more different portions of the driving waveform is a portion of an ejecting pulse (as seen in fig. 15), and the non-ejecting pulse generated by said driving signal generating unit using the two or more different portions of the driving waveform has a pulse width greater than that of the ejecting pulse and has a smaller electric potential difference than that of the ejecting pulse (this limitation is not found in the disclosure and thus is not taken into consideration for purposes of examination; in addition, please note that the importance of the non-ejecting pulse being kept small is pointed out, at least, in paragraphs 0015, 0081, 0088 and 0099; also see, 112 rejections above).
- **Claims 4 and 11:** wherein the driving signal generating unit produces the non-ejecting pulse that draws in a meniscus of the nozzle (page 28, lines 5-8).
- **Claims 5 and 12:** wherein the driving signal generating unit produces the non-ejecting pulse that pushes out a meniscus of the nozzle and has a pulse width smaller than a period of pressure-induced resonance in a liquid chamber of the ejection head (so that the droplet is not ejected).
- **Claims 6 and 13:** wherein the non-ejecting pulse has a falling edge with a first rate of voltage change and a rising edge with a second rate of voltage change that is smaller than the first rate of voltage change (page 39, line 25 through page 41, line 2).

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- **Claims 7 and 14:** wherein the non-ejecting pulse includes a first portion that draws in a meniscus of the nozzle with a first rate of voltage change and a second portion that restores the meniscus of the nozzle with a second rate of voltage change smaller than the first rate of voltage change (as seen in fig. 10; page 27, line 19 through page 28, line 13).
- **Claims 8 and 15:** wherein the non-ejecting pulse includes a first waveform that pushes out a meniscus of the nozzle and a second waveform that follows the first waveform to draw in the meniscus of the nozzle, the first waveform having a pulse width smaller than a resonant frequency of a liquid chamber of the ejection head (page 34, lines 1-9).
- **Claims 9 and 16:** wherein the driving signal includes a first non-ejecting signal inserted at a beginning of the driving signal (holding signal b; page 28, line 2 through page 29, line 23) and a second non-ejecting signal inserted at an end of the driving signal (as seen in fig. 15a).
- **Claims 10 and 17:** wherein the ejection head includes an actuator (piezoelectric vibrator 52) for producing a pressure to eject the droplet, and the driving signal including the non-ejecting pulse is applied to the actuator (page 22, lines 6-19).

Response to Arguments

11. Applicant's arguments with respect to claim 1-17 have been considered but are moot in view of the new ground(s) of rejection. Please refer to 112 rejections.

12. Regarding applicant's argument that Figures 14A through 14E show the missing feature, please note that the drawing or its explanation are not sufficient to draw the conclusion that the pulse width of the non-ejecting [dummy] pulse is greater than that of the ejecting pulse. The pulse width of the first dummy pulse is shorter than the ejecting pulse and the second pulse has the same potential difference as some of the other portions of the driving pulse.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JANNELLE M. LEBRON whose telephone number is (571)272-2729. The examiner can normally be reached on Monday thru Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/
Supervisory Patent Examiner, Art Unit 2861

/Jannelle M. Lebron/
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